Boiler Inspector, Step 1

New Hires are placed at step one until they meet the minimum requirements and qualifications to move to step two. To move to step two, an inspector at step one must obtain the following inspection credentials as mandated by the State of Wisconsin:

1. ***Commissioned as a Boiler & Pressure Vessel Inspector by the National Board of Boiler & Pressure Vessel Inspectors***
2. ***State of Wisconsin Boiler – Pressure Vessel Inspector***
3. ***Wisconsin Uniform Dwelling Code Heating, Ventilation and Air-Conditioning (HVAC) Certification***

An inspector holding these credentials upon entering the City of Milwaukee Boiler section, with supervisor and DNS administrative approval, may be eligible for appointment to a higher career ladder step (based on certifications held at the time of appointment) with the one year probationary period waived for the sole purposes of this Career Ladder. Separate probationary period requirements mandated by the Department of Employee Relations still apply.

Secondly, an inspector must demonstrate a thorough knowledge pertaining to the fundamentals of performing basic boiler inspections as they relate to good communication, installation methodologies, code knowledge, problem solving and code interpretation and its enforcement. Listed below is a representation of the core competencies that a BI must have a thorough knowledge of:

General Competencies

- *Customer Communication Skills*
- *Management and Control of Assigned permits*
- *Familiarity of Necessary Zoning*
- *Ability to coordinate with other DNS sections and City Entities*
- *Ability to Evaluate and Interpret Construction Plans pertaining to boiler inspection*
- *Thorough knowledge of the Milwaukee Code of Ordinances*
- *Code Administration and Definitions of Commercial and 1&2 Family Construction Codes*
- *Familiarity of DNS processes and skill set with regards to computer programs.*

Boiler – Pressure Vessel Competencies

- Inspection
  - General Requirements
  - Installation Requirements
  - Periodic Inspections
  - Exemptions from Periodic Inspections
  - Internal Inspections
  - Reporting of Periodic Inspections
  - Permit to Operate, State of Wisconsin
- Installation Requirements
  - Safety Rules
  - Safety Controls
  - Low-Water Cutoff, Water Feeder
  - Boiler Blowoff Equipment
  - Pressure gages for Air Receivers
  - Protection of Vessels supplied through pressure reducing stations
  - Portable Boilers
  - Identification Requirements
  - Maintenance

  - Reporting of Incidents, Repairs, Alterations
  - Condemnation
- New Installations
  - Registration
  - ASME Code Vessels
  - Wisconsin Special Vessels
  - US DOT Vessels
  - Non-Code Vessels
  - Power Piping
  - Multi-Boiler Installations
  - Organic – or Synthetic – fluid heat-transfer systems
  - Solid-fuel-fired-water-heating appliances
- Nuclear Power Plants
- Repairs & Alterations
- Secondhand Vessels
- Historical Boilers

1 &2 Family Uniform Dwelling Code (UDC) Competencies

Energy Conservation

- *Energy Conservation Scope and Application*
- *Insulation Materials & Installation Basic Requirements and Protection*
- *Thermal Envelope Design & Requirements*
- *Prescriptive Insulation and Fenestration Criteria*
- *Specific Insulation Requirements*
- *Indoor Temperatures & Equipment Sizing*
- *Temperature Control*
- *Duct Systems*
- *Duct & Plenum Sealing*
- *Pipe Insulation*
- *Air-Conditioner & Heat Pump Efficiencies*
- *Replacement Furnace & Boiler Efficiencies*
- *Simulated Performance Alternative Energy Conservation*

Heating, Ventilating & Air-Conditioning Design

- *Selection of Heating Equipment*
- *Types & Location of Equipment*
- *Solid-Fuel Burning Equipment*
- *Safety Controls*
- *Combustion Air*
- *Mechanical Draft Systems*
- *Equipment Maintenance Information*
- *Air Distribution Systems*
- *Ductwork*
- *Damper, Registers & Grills*
- *Piping*
- *Factory-Built Chimneys or Vents*
- *Gas Vents*
- *Chimney Connectors, Smoke Pipes & Stovepipes*
- *Multiple Appliance Venting*
- *Condensate Drains*
- *Fuel Storage & Supply Systems*
- *Equipment Location and Operation*

Additional Steps

After attainment of job required certifications and licensure as required in the job description along with supervisor and DER approval the inspector may begin advancing in the career ladder. The below listed steps may be achieved in any order.

In order to advance to pay step 2 using Step options 2-6, the inspector must have achieved the Step 1 requirements and be able to provide evidence of completion for one of the below listed Qualitative Steps.

In order to advance to pay step 3 using Step options 2-6, the inspector must have achieved the Step 1 requirements and be able to provide evidence of completion for two of the below listed Qualitative Steps.

In order to advance to pay step 4 using Step options 2-6, the inspector must have achieved the Step 1 requirements and be able to provide evidence of completion for three of the below listed Qualitative Steps.

In order to advance to pay step 5 using Step options 2-6, the inspector must have achieved the Step 1 requirements and be able to provide evidence of completion for four of the below listed Qualitative Steps.

In order to advance to pay step 6 using Step options 2-6, the inspector must have achieved the Step 1 requirements and be able to provide evidence of completion for five of the below listed Qualitative Steps.

In each case above, for advancement to a higher pay step, the inspector shall obtain the required Qualitative and Quantitative measures associated with the step they are requesting. The quantitative core competencies must be achieved in the sequential order as outlined in the Quantitative Core Competencies document. In addition, inspector's performance, customer service, job skill and knowledge is subject to review by the supervisor for applicability for the step being requested and the time frame to be analyzed taking into consideration training, specialty projects, inspector workload, district composition, and other factors that may have an impact on performance.

Boiler Inspector, Step Option 2

To advance using Step Option 2, the inspector must provide evidence of completion for coursework issued by the American Society of Mechanical Engineers (ASME) and American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE):

1. ***American Society of Mechanical Engineers – Controls and Safety Devices 1 (ASME CSD-1)***
2. ***SUCCESSFUL COMPLETION OF THREE OF THE FOLLOWING ON-LINE COURSES BY ASHRAE***
    a. ***Fundamentals of Refrigeration***
    b. ***Fundamentals of Heating and Cooling Loads***
    c. ***Fundamentals of Steam System Design***
    d. ***Fundamentals of Heating Systems***
    e. ***Fundamentals of Thermodynamics***
    f. ***Fundamentals of Water System Design***

Listed below is a representation of the core competencies that an inspector must have a thorough knowledge of to achieve Step Option 2:

ASME CSD-1

- **General**
    a. General Requirements and Provisions

b. Material Requirements
c. Testing and Maintenance
d. Certification and Reporting
e. Operations

- **Electrical Requirements**
- **Steam and Waterside Control**
    a. Automatic Low-Water Fuel Cutoff and/or Combined Water Feeding Device
    b. Automatic Fuel Cutoff for Forced Circulation Boilers
    c. Pressure Controls
    d. Temperature Controls
    e. Safety and Safety Relief Valves
    f. Modular Boilers
- **Combustion Side Control**
    a. Gas-Fired Boiler Units, Equipment
    b. Gas-Fired Boiler Units, Purging
    c. Gas-Fired Boiler Units, Safety Controls
    d. Oil-Fired Boiler Units, Equipment
    e. Oil-Fired Boiler Units, Safety Controls
    f. Low Fire Start, Gas or Oil Fired Boilers
    g. Combination Gas and Oil Fired Units
    h. Electrically Heated Boilers
    i. Combustion Side Controls for Modular Boilers

ASHRAE Fundamentals

- **Fundamentals of Refrigeration**
    - Fundamentals of Refrigeration
    - Fundamentals of Thermodynamics
    - Multistage and Cascade Refrigeration Cycles
    - Evaporators
    - Compressors
    - Condensers
    - Refrigerant Flow in Pipes, Valves and Pumps
    - Expansion Devices
    - Pressure Vessels and Refrigerant Management
    - Refrigerant Selection
    - Product Cooling, Freezing Loads and Cooling Secondary Fluids
    - Practical Guide to Refrigeration Systems

- **Fundamentals of Heating and Cooling Loads**
    - Heat Transfer and Load Calculation
    - Simple Heat Loss Calculation Procedure
    - Temperature Design Conditions and Weather Data
    - Thermal Properties of Materials
    - Heat Transfer Through Walls, Roofs and Floors
    - Infiltration and Ventilation
    - Cooling Load Calculations

  - Air-Conditioning Loads on Walls, Roofs and Partitions
  - Cooling Loads from Windows
  - Internal Loads
  - Example Heating and Cooling Load Calculation Transfer Function Method

- **Fundamentals of Steam System Design**
  - Introduction to Steam System Design
  - HVAC Steam Systems
  - Terminal Units I
  - Terminal Units II
  - Boilers
  - Steam Valves, Steam Traps, Flash Tanks, and Condensate Receiver Tanks
  - Steam Piping Design

- **Fundamentals of Heating Systems**
  - Introduction
  - Overview of Heating Systems
  - Basic Selection Criteria
  - Commercial Heating Systems
  - Industrial Heating Systems
  - Residential Heating Systems
  - Heating Cost Calculations
  - Codes and Standards
  - Building Commissioning and Maintenance

- **Fundamentals of Thermodynamics**
  - Introduction to HVAC
  - Systems, Properties, States and Processes
  - Property Diagrams for Pure Substances
  - Thermodynamic Tables and Charts
  - Ideal Gas Law and Air Tables
  - Heat and Work
  - First Law of Thermodynamics Applied to Closed Systems
  - First Law of Thermodynamics Applied to Open Systems
  - Applications of the First Law of Thermodynamics
  - The Carnot Cycle
  - Refrigeration Cycles - Ideal Cycles
  - Refrigeration Cycles - Actual Cycles
  - Combustion and Thermochemistry

- **Fundamentals of Water System Design**
  - Water System Design Components
  - Piping System Design
  - Pipe Materials and Fittings
  - Centrifugal Pumps
  - Terminal Unit Performance and Control
  - Expansion Tanks and Air Elimination
  - Piping System Development
  - Matching Pumps to Systems

- **Water Chillers and Load Control**

These skills and certifications build on important priorities of the boiler pressure vessel and mechanical refrigeration codes that the inspector should already be familiar with and encounter on a regular basis in public buildings.

*Additionally, an inspector advancing from using this step option must also meet or exceed the thresholds for advancement established in the **QUANTITATIVE CORE COMPETENCIES.** This separate quantitative core competencies packet for this position is subject to review by the department manager for applicability with regards to the time frame analyzed while taking into consideration applicable training, specialty projects, inspector workload, district composition, and other factors that may have in impact on performance.*

Boiler Inspector, Step Option 3

To advance using Step Option 3, the inspector must obtain the following inspection credentials issued by the American Society of Sanitary Engineers (ASSE) and complete the listed coursework available from the American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE):

1. ***Cross-Connection Control Tester or Cross Connection Surveyor***
2. ***SUCCESSFUL COMPLETION OF ALL SIX OF THE FOLLOWING ON-LINE COURSES BY ASHRAE***
    a. ***Fundamentals of Refrigeration***
    b. ***Fundamentals of Heating and Cooling Loads***
    c. ***Fundamentals of Steam System Design***
    d. ***Fundamentals of Heating Systems***
    e. ***Fundamentals of Thermodynamics***
    f. ***Fundamentals of Water System Design***

An inspector completing Qualitative Step Option 3 must demonstrate a working knowledge pertaining to cross-connection requirements for protecting the buildings water supply from contaminants as well as develop a greater understand of the fundamentals energy through participation and successful completion of the ASHRAE courses.

Listed below is a representation of the core competencies that an inspector must have a thorough knowledge of to achieve Step Option 3:

Cross-Connection

Back Flow Prevention History

- *Legal Precedent*
- *Federal Laws and Regulations*
- *Safe drinking water act*
- *Incidents*

Backflow Prevention Hydraulics

- *Water characteristics and Pressure*
- *Backflow*
- *Fluid Flow Fundamentals*
- *Cross-Connection Types*
- *Cross-Connection Control Isolation*
- *Cross-Connection Control Containment*
- *Thermal Expansion*

Code and Installation Criteria

- *Identification of potable and non-potable water systems*
- *Unlawful connections*
- *Cross-connection control*
- *Protection from backflow in underground piping*
- *Dangerous connections*
- *Enclosures*
- *Air gap separation*
- *Barometric loop*
- *Anti-siphon fill valves for gravity water closet flush tanks*
- *Hose Bibb devices*
- *Hose connection vacuum breakers*
- *Vacuum breaker wall hydrants, freeze-resistant, automatic draining type*
- *Hose connection back flow preventers*
- *Beverage equipment devices*
- *Beverage dispensing equipment*
- *Trap seal primer valves*
- *Laboratory faucet vacuum breakers*
- *Check valves*
- *Reduced pressure principle assembly*
- *Gauges*
- *Differential pressure gauge*
- *Water column*
- *ASSE standard 1064*

Backflow preventer testing

- *Field test*
- *Equipment*

- *Test results*
- *Pre-test*
- *Assembly test preparation*
- *Testing the DC/RP detector assembly*
- *Equipment maintenance*

Fire-sprinkler system backflow prevention

- *Fire-sprinkler installations*
- *Water based suppression systems*
- *Dry pipe pressurized and pre-action systems*
- *NFPA 13*
- *NFPA 20*
- *NFPA 25*

Additionally, an inspector advancing from using this step option must also meet or exceed the thresholds for advancement established in the ***QUANTITATIVE CORE COMPETENCIES.*** *This separate quantitative core competencies packet for this position is subject to review by the department manager for applicability with regards to the time frame analyzed while taking into consideration applicable training, specialty projects, inspector workload, district composition, and other factors that may have in impact on performance.*

Boiler Inspector, Step Option 4

To advance using Step Option 4, the inspector must obtain the following inspection credentials issued by the International Code Council (ICC):

1. ***ICC – Commercial Energy Inspector OR ICC – Mechanical Inspector***

Alternative to obtaining the ICC – Commercial Energy Inspector credential would be to complete 6 credits with a 2.5 GPA or higher in the following courses offered at Milwaukee Area Technical College (MATC):

- ***SUSTN-101 Environmental Controls Technician (3 credits)***
- ***SUSTN-103 Commissioning Process: Sustainability and Energy Efficiency (3 credits)***
- ***SUSTN-104 Energy Auditing and Managing Energy Use (3 credits)***
- ***SUSTN-106 Measurement and Verification (3 credits)***

Alternative to obtaining the ICC – Commercial Mechanical Inspector credential would be to complete 6 credits with a 2.5 GPA or higher in the following courses offered at Milwaukee Area Technical College (MATC):

- ***HVAC2-110 Air Conditioning Fundamentals (3 credits)***
- ***HVAC2-113 Electrical Fundamentals (3 credits)***
- ***HVAC2-114 Electrical Controls and Systems (4 credits), prerequisite of HVAC2-113***
- ***HVAC2-132 Architectural and Mechanical Fundamentals (4 credits)***

AND

2. ***ICC - Fuel Gas Inspector***

An inspector completing Qualitative Step Option 4 must demonstrate a thorough knowledge pertaining to the fundamentals of energy conservation and mechanical systems as well as understand fuel gas systems and their associated components. How we treat a buildings thermal envelope and the heat loss associated with it can have a dramatic impact on the life cycle of a building and the interior environment for the occupants. Likewise, hazardous mechanical tanks used for propane or fuel gas begin to come into play at this level. Listed below is a representation of the core competencies that an inspector must have a thorough knowledge of to achieve Step Option 4:

ICC - Commercial Energy Inspector - Core Competencies

1. ***General Plan Review Issues***

- *Applicability to determine if a building is required to comply with the provisions of the energy code.*
- *Additions, Alterations, and Change Of use. Verify whether the work is required to comply with provisions of the code for new buildings and determine if the occupancy or use of the structure has changed so as to require energy code compliance.*

2. ***Building Envelope***
   - *General Envelope Requirements*
   - *Opaque Envelope Compliance*
   - *Windows, Skylights, and Doors*
   - *Air Leakage*
   - *Moisture Control*
3. ***Mechanical Systems***
   - *Mechanical Summary. Verify installed equipment complies with the construction documents for type, size, and efficiencies. Verify operation manuals are provided with the equipment where required.*
   - *Energy Recovery and Complex Systems*
   - *Economizers*
   - *Duct and Piping Systems. Inspect HVAC equipment, ducts, and piping for required insulation and sealing as specified on construction documents and where required by the code.*
   - *Fan and Pump Systems*
   - *HVAC Controls*
4. ***Electrical Power and Lighting Systems***
   - *Exempt Lighting and Equipment.*
   - *Lighting Power*
   - *Lighting Controls. Verify compliance of lighting controls for building interiors and exteriors as specified on construction documents and as required by the code.*
   - *Wiring Methods and Metering.*
5. ***Building Service Water Heating Systems and Equipment***
   - *Water Heating Equipment. Inspect piping insulation, circulation pump controls, heat traps, point of use controls, pool heaters, and covers are installed as specified on construction documents and as required by the code.*

MATC Sustainability Courses – Core Competencies

- Energy management system upgrades
- Energy management system operation
- Energy management system maintenance
- Energy management system software
- Energy management system technologies
- Sustainable energy commissioning process
- Energy auditing
- Energy savings measurement
- Energy savings verification

ICC - Commercial Mechanical Inspector - Core Competencies

1. ***Administration***
   - *Mechanical System Plan Reading*
   - *Manufacturer's Installation Instructions*
2. ***Heating/Cooling/Water Heaters***
   - *Installations Of Mechanical Equipment Comply With Code Requirements*
   - *Clearances For Equipment Is Maintained*
   - *Proper Access Is Provided*
   - *Supply And Return Air*

- *Connections To Plenums*
- *Boiler And Water Heater Requirements*
- *Fuel Burring Equipment, Crematories, Incinerators, Hydronic Heating Systems, Sauna Heaters, Decorative Appliances, Etc…*

3. ***Exhaust And Ventilation Systems***
   - *Hazardous Exhaust Systems*
   - *Source Capture Systems*
   - *Supply, Return, And Outside Air Requirements*
   - *Ventilation Requirements*
   - *Exhaust Systems*
   - *Kitchen Hood Systems*
   - *Product Conveying Ventilations Systems*

4. ***Duct Systems***
   - *Duct Construction And Installation*
   - *Support Of Ducts*
   - *Duct And Plenum Design*
   - *Smoke And Fire Dampers*
   - *Fire Suppression Requirements*
   - *Smoke Detection Requirements*

5. ***Combustion Air***
   - *Proper Sources For Air Supply To Fuel Burning Appliances*
   - *Size And Locations Of Openings*
   - *Materials For Installation*

6. ***Chimneys And Vents***
   - *Size, Type And Location Of Venting*
   - *Vent Connections And Terminations*

7. ***Fuel Supply Systems***
   - *Gas Piping Systems Are Installed With Proper Materials*
   - *Fittings, Valves And Connections Are In Compliance With The Code*

MATC HVAC Courses – Core Competencies

- HVAC electrical theories
- HVAC electrical equipment
- HVAC controls operating principles
- HVAC circuit components
- HVAC system servicing
- HVAC system troubleshooting
- HVAC measuring instruments
- HVAC fundamentals (heating, cooling, human comfort, psychometrics)
- HVAC system design
- HVAC blueprint reading, symbols & drawings
- Mechanical schematics
- Isometric piping & flow diagrams

ICC – Fuel Gas Inspector - Core Competencies

- *Structural Safety*
- *Appliance location*
- *Combustion, ventilation and dilution air*
- *Installation*
- *Access and service space*
- *Condensate disposal*
- *Clearance reduction*
- *Electrical*
- *Electrical bonding*
- *Pipe sizing*

- *Piping materials*
- *Piping system installation*
- *Piping bends and changes in direction*
- *Inspection, testing and purging*
- *Piping support*
- *Drips and sloped piping*
- *Shutoff valves*
- *Flow controls*
- *Appliance and manufactured home connections*
- *Liquefied petroleum gas motor vehicle fuel dispensing facilities*
- *Compressed natural gas motor vehicle fuel dispensing facilities*
- *Supplemental and standby gas supply*
- *Piping support intervals*
- *Overpressure protection devices*
- *Venting of appliances*
- *Sizing of venting systems for appliances*
- *Direct vent, integral vent, mechanical vent and ventilation/exhaust hood venting*
- *Factory-built chimneys*
- *Log lighters*
- *Decorative appliances for installation*
- *Incinerators and crematories*
- *Commercial-industrial incinerators*
- *Vented wall furnaces*
- *Floor furnaces*
- *Duct furnaces*
- *Clothes dryers*
- *Clothes dryer exhaust*
- *Sauna heaters*
- *Engineer and gas turbine-powered equipment*
- *Boilers*
- *Infrared radiant heaters*
- *Equipment installed in existing unlisted boilers*
- *Gaseous hydrogen systems*
- *Piping use and handling of hydrogen*
- *Testing of hydrogen piping systems*
- *Locations of gaseous hydrogen systems*
- *Operation and maintenance of gaseous hydrogen systems*
- *Design of liquefied hydrogen systems associated with hydrogen vaporization operations*

*Additionally, an inspector advancing from using this step option must also meet or exceed the thresholds for advancement established in the **QUANTITATIVE CORE COMPETENCIES.** This separate quantitative core competencies packet for this position is subject to review by the department manager for applicability with regards to the time frame analyzed while taking into consideration applicable training, specialty projects, inspector workload, district composition, and other factors that may have in impact on performance.*

Boiler Inspector, Step Option 5

To advance using Step Option 5, the inspector must obtain one of the following inspection credentials issued by the State of Wisconsin or the American Welding Society or the American Society of Power Engineers or the National Institute for the Uniform Licensing of Power Engineers.:

1. ***American Welding Society (AWS) Certified Welding Inspector***
   OR
2. ***State of Wisconsin Commercial Building Code Inspector***
   OR
3. ***Boiler Operator License from American Society of Power Engineers (ASOPE) or National Institute for the Uniform Licensing of Power Engineers (NIULPE)***

An inspector completing Qualitative Step Option 5 must demonstrate a thorough knowledge pertaining to the fundamentals of welding, boiler operation and Building code related items that come associated with

preforming inspections. Listed below is a representation of the core competencies that an inspector must have a thorough knowledge of to achieve Step Option 5:

American Welding Society (AWS) Certified Welding Inspector

- Welding Processes
- Heat Control & Metallurgy
- Weld Examination
- Weld Performance
- Definitions & Terminology
- Symbols – Welding and NDE
- Reports and Records
- Duties and Responsibilities
- Safety
- Destructive Tests
- Cutting
- Brazing
- Soldering
- Procedure and Welder Qualifications
- Mechanical Tests and Properties
- Welding Inspection and Flaws
- Non Destructive Examination (NDE)
- Utilization of Specification and Drawings
- Materials and Design
- Fabrication
- Inspection
- Qualification

Commercial Code Competencies

- *Use and Occupancy Classifications*
- *Special Use Occupancies and Elements*
- *Height and Area Limitations Based on Type of Construction*
- *Fire Resistance and Protection Requirements*
- *Interior Finishes*
- *Use and Application of Glass, Glazing, Safety Glazing & Plastics*
- *Means of Egress*
- *Accessibility*
- *Building Systems Such as Lighting, HVAC, Plumbing Fixtures, Elevators, Generators*
- *Structural Components Such as Masonry, Wood, Steel and their Performance and Stability*
- *Safeguards During Construction*
- *Erosion Control and Storm Water Management Regulations*
- *Special Construction Such as Membrane Structures, Tents & Awnings*
- *Hazardous Occupancies*
- *Use & Application of the International Existing Building Code*
- *Use & Application of the International Fuel Gas Code*
- *Use & Application of the International Mechanical Code*
- *Use & Application of the International Energy Conservation Code*

- *Use & Application of ANSI A117.1 Standard for Accessible and Usable Buildings and Facilities*
- *Competency of Code Referenced Standards*
- *General Knowledge of the Milwaukee Code of Ordinances*
- *Familiarity and Application of the International Fire Code*

Boiler Operator License

- Boiler Fittings
- Combustion Theory
- Fuels and Burner Types
- Operating Practices for steam and hydronic boilers
- Operation and care of oil and gas boilers
- Boiler safety and operating controls
- Dangerous boiler conditions
- Industry safety
- Preventative Maintenance
- Facility valve identification
- Facility steam systems and accessories
- Electrical theory
- Make-up water systems

Additionally, an inspector advancing from using this step option must also meet or exceed the thresholds for advancement established in the QUANTITATIVE CORE COMPETENCIES. This separate quantitative core competencies packet for this position is subject to review by the department manager for applicability with regards to the time frame analyzed while taking into consideration applicable training, specialty projects, inspector workload, district composition, and other factors that may have in impact on performance.

Boiler Inspector, Step Option 6

To advance using Step Option 6, the inspector must obtain <u>one</u> the following inspection credentials issued by the International Code Council (ICC) or through other means described below:

1. ***International Code Council Certification***
   ICC – Certified Building Official (CBO)
   a. ***Management Module***
   b. ***Legal Module***
   c. ***Building Codes and Standards Module***
   <u>OR</u>
2. ***Have obtained an associate's degree in engineering, architecture, construction management, construction technology or a field closely related to construction.***
   <u>OR</u>
3. ***Have successfully completed 60 college credits of which a minimum of 39 credits are job-related or engineering-related, architectural design-related or construction management related.***
   <u>OR</u>
4. ***Have obtained a Bachelor's degree in engineering, architecture, architectural engineering, construction management, construction technology, mechanical engineering, or a field closely related to construction.***

OR

5. ***Have obtained licensure through the State of Wisconsin as a Registered Architect or Professional Engineer.***

An inspector completing Qualitative Step Option 6 must demonstrate a thorough knowledge pertaining to the fundamentals of hazardous liquid, chemical, combustible, radioactive, health hazard occupancies, system and the equipment associated with them. Listed below is a representation of the core competencies that an inspector must have a thorough knowledge of to achieve Step Option 6:

Building Code Official Competencies

Legal Module

1. Financial Management
   - Budgets And Financing
   - Implementation Of Financial Checks
   - Verification Of Revenue Generation And Expenditures
2. Records Management
   - Maintenance Of Employment Records
   - Code Enforcement Records
3. Personnel Management
   - Job Descriptions And Personnel Equipment
   - Personnel Supervision
   - Time-Management Efficiency
   - Anti-Discrimination
   - Employee Working Conditions
   - Employee Discipline And Grievance
   - Employee Professional Development
4. Interagency, Legislative, And Public Communication
   - Code Adoption And Amendments
   - Alternative Methods Through Appeals
   - Interagency Cooperation
   - Public Service And Information
5. Code Enforcement
   - Permits, Notices And Orders
   - Right Of Entry
   - Hazard Abatement
   - Tort Liability
   - Legal Due Process

Court Prosecution

Technology Module

- Architectural Plan Review
- Use And Occupancy Classification
- Construction Classification
- Means Of Egress Provisions
- Light, Ventilation And Sanitation Provisions
- Fire Resistance And Fire Protection Provisions
- Accessibility Provisions
- Environmental And Natural Hazard Provisions
- Special Use/Occupancy Provisions

1. Structural Plan Review
   - Structural Provisions
   - Material Standards And Construction Methods
2. Building System Plan Review
   - Mechanical Provisions
   - Plumbing Provisions
   - Electrical Provisions
3. Field Inspection
   - Site Inspection
   - Foundation Inspection
   - Structural Frame Inspection
   - Building Envelope Inspection
   - Electrical Inspections
   - Plumbing Inspection
   - Mechanical Inspection
   - Fire Protection Inspection
   - Final Building Inspection

Additionally, an inspector advancing from using this step option must also meet or exceed the thresholds for advancement established in the ***QUANTITATIVE CORE COMPETENCIES.*** *This separate quantitative core competencies packet for this position is subject to review by the department manager for applicability with regards to the time frame analyzed while taking into consideration applicable training, specialty projects, inspector workload, district composition, and other factors that may have in impact on performance.*